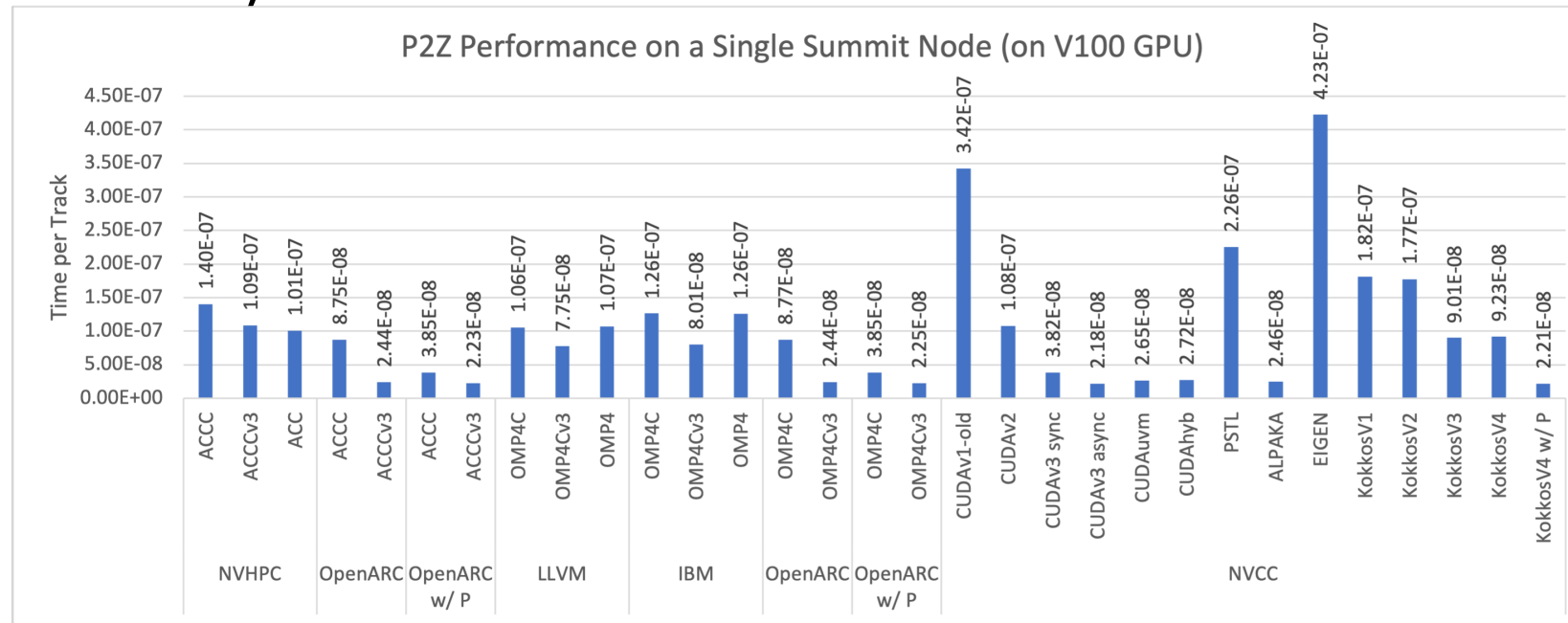# P2Z GPU Version Performance on Summit

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P2Z GPU Version Performance on a Summit Node (NITER = 10)

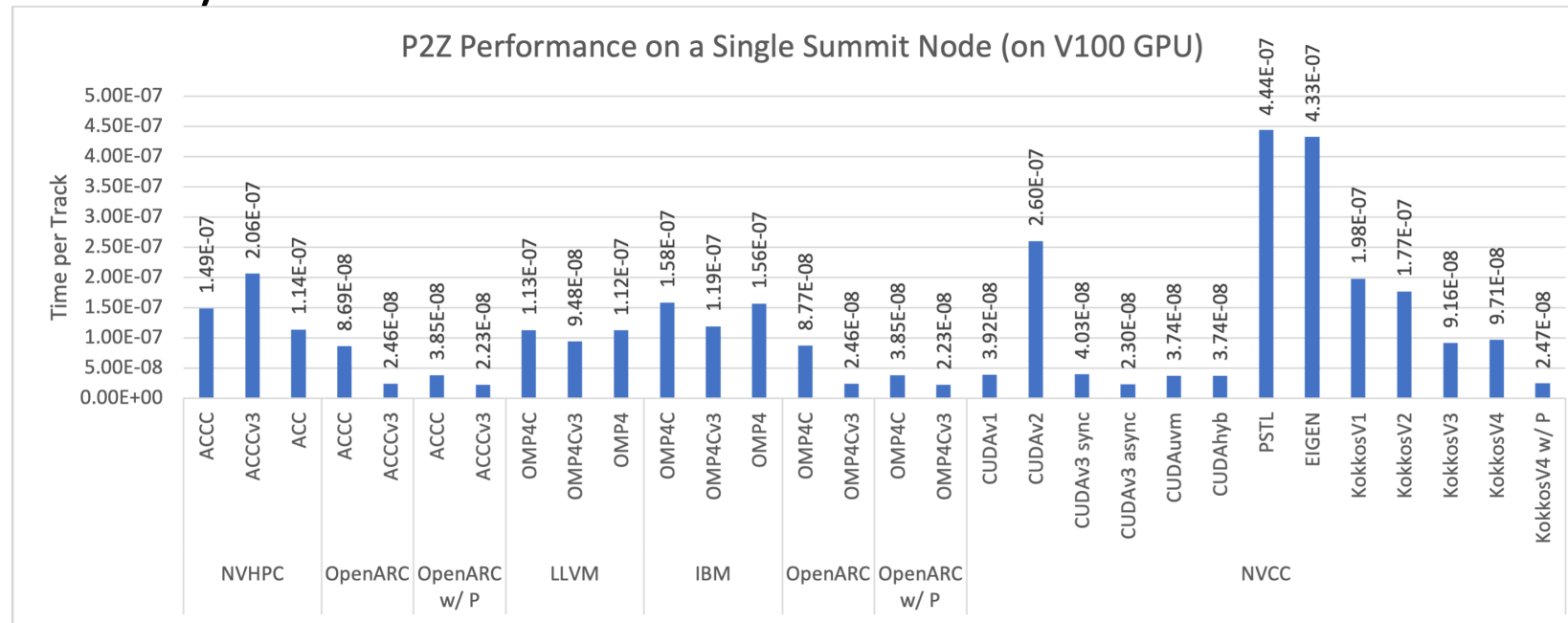P2Z Performance on a Single Summit Node (on V100 GPU)

- **ACCC**: OpenACC C sync version
- **ACCCv3**: OpenACC C async version
- **ACC**: OpenACC C++ sync version
- **OMP4C**: OpenMP4 C sync version
- **OMP4Cv3**: OpenMP4 C async version
- **OMP4**: OpenMP4 C++ sync version

- **CUDAv1-old**: CUDA unified memory version   (no shared memory)
- **CUDAv2**: CUDA sync version (no shared memory)
- **CUDAv3 sync**: CUDA V3 sync version
- **CUDAv3 async**: CUDA V3 async version
- **CUDAuvm**: CUDA unified memory version
- **CUDAhyb**: hybrid CUDA version with UVM

- **PSTL**: C++ parallel STL
- **ALPAKA**:
- **EIGEN**:
- **KokkosV1**: CUDA unified memory
- **KokkosV2**: same patterns as KokkosV1 but with explicit memory transfers
- **KokkosV3**: same patterns as CUDAv3 sync but w/o host memory prepinning
- **KokkosV4**: same patterns as CUDAv3 async version

Compilers: NVHPC (V22.5), OpenARC (V0.73), LLVM (V15.0), IBM (V16.1.1), and NVCC (V11.0) (**w/ P :** with host memory prepinning) (All CUDA versions are w/ P)

P2Z GPU Version Performance on a Summit Node (NITER = 1)

P2Z Performance on a Single Summit Node (on V100 GPU)

Time per Track

Version	Value
ACCC	1.49E-07
ACCCv3	2.06E-07
ACC	1.14E-07
ACCC	8.69E-08
ACCCv3	2.46E-08
ACCC	3.85E-08
ACCCv3	2.23E-08
OMP4C	1.13E-07
OMP4Cv3	9.48E-08
OMP4	1.12E-07
OMP4C	1.58E-07
OMP4Cv3	1.19E-07
OMP4	1.56E-07
OMP4C	8.77E-08
OMP4Cv3	2.46E-08
OMP4C	3.85E-08
OMP4Cv3	2.23E-08
CUDAv1	3.92E-08
CUDAv2	2.60E-07
CUDAv3 sync	4.03E-08
CUDAv3 async	2.30E-08
CUDAuvm	3.74E-08
CUDAhyb	3.74E-08
PSTL	4.44E-07
EIGEN	4.33E-07
KokkosV1	1.98E-07
KokkosV2	1.77E-07
KokkosV3	9.16E-08
KokkosV4	9.71E-08
KokkosV4 w/ P	2.47E-08

Compiler groupings: NVHPC, OpenARC, OpenARC w/ P, LLVM, IBM, OpenARC, OpenARC w/ P, NVCC

- **ACCC**: OpenACC C sync version
- **ACCCv3**: OpenACC C async version
- **ACC**: OpenACC C++ sync version
- **OMP4C**: OpenMP4 C sync version
- **OMP4Cv3**: OpenMP4 C async version
- **OMP4**: OpenMP4 C++ sync version

- **CUDAv1**: CUDA unified memory version (shared memory: same as CUDAv3)
- **CUDAv2**: CUDA sync version (no shared memory)
- **CUDAv3 sync**: CUDA V3 sync version
- **CUDAv3 async**: CUDA V3 async version
- **CUDAuvm**: CUDA unified memory version
- **CUDAhyb**: hybrid CUDA version with UVM

- **PSTL**: C++ parallel STL
- **EIGEN**:
- **KokkosV1**: CUDA unified memory
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Compilers: NVHPC (V22.5), OpenARC (V0.73), LLVM (V15.0), IBM (V16.1.1), and NVCC (V11.0) (**w/ P :** with host memory prepinning) (All CUDA versions are w/ P)